CLAIMS

What is claimed is:

1. A gain flattening filter for use in fiber optic communications, the gain flattening filter comprising:

a substrate having a first surface and a second surface;

a first film disposed on the first surface of the substrate, the first film configured to attenuate one or more channels in a light signal; and

a second film disposed on the second surface of the substrate, the second film arranged to receive the light signal from the first film and to reflect at least a portion of the light signal back through the first film that attenuates the one or more channels a second time.

2. The gain flattening filter of claim 1 wherein the first film is a gain flattening filter (GFF) film.

3. The gain flattening filter of claim 1 wherein the second film is a high reflection (HR) film.

4. The gain flattening filter of claim 3 wherein the HR film is adapted to allow a percentage of the light signal to pass through the HR film.

5. The gain flattening filter of claim 3 wherein the HR film is adapted to allow one or more wavelengths of light to pass through the HR film.

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6. A gain flattening filter for use in fiber optic communications, the gain flattening filter comprising:

a substrate having a first surface and a second surface;

a first film disposed on the first surface of the substrate, the first film configured to attenuate one or more channels in a light signal;

an second film disposed on the second surface of the substrate, the second film arranged to receive the light signal from the first film and to reflect at least a portion of the light signal back through the first film, that attenuates the one or more channels;

an input port adapted to direct an input light signal into the gain flattening filter; and

an output port adapted to receive an output light signal reflected by the second film.

7. The fiber optic component of claim 6, further comprising a first lens configured to direct the input light signal from the input port to the gain flattening filter.

8. The fiber optic component of claim 6, the HR film configured to allow a portion of the input signal to pass through the HR film, the fiber optic component further comprising:

a tap port optically coupled to the HR film and adapted to receive the portion of the input signal; and

a second lens adapted to launch the portion of the input signal into the output port.

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9. The fiber optic component of claim 6, the input port comprising at least a portion of an optical amplifier.

10. The fiber optic component of claim 6, the output port comprising at least a portion of an optical amplifier.

11. The fiber optic component of claim 6, the HR film configured to allow a portion of the input signal to pass through the HR film, the fiber optic component further comprising a photodiode optically coupled to the HR film and adapted to receive the portion of the input signal and to produce an electronic signal in response to receiving the portion of the input signal.

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12. A method of manufacturing a fiber optic component that includes a gain flattening filter, the method comprising:

forming a GFF film on a first surface of an optical substrate; and

forming an HR film on a second surface of an optical substrate, wherein forming an HR film on a second surface comprises arranging the HR film so that the HR film is configured to receive light that has pass through the GFF film and to reflect at least a portion of the light back to the GFF film.

13. The method of claim 12, further comprising:

optically coupling an input port to the GFF film, the input port configured to direct light into the GFF film; and

optically coupling an output port to the GFF film, the output port configured to receive light reflected from the HR film through the GFF film.

14. The method of claim 12, wherein the HR film is adapted to allow at least a portion of the light to pas through the HR film, the method further comprising optically coupling a tap port to the HR film for receiving the at least a portion of the light.

15. The method of claim 12, wherein the HR film is adapted to allow at least a portion of the light to pass through the HR film, the method further comprising optically coupling a photodiode to the HR film for receiving the at least a portion of the light and producing an electronic signal.

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16. A method of equalizing non-uniform gain in an optical signal comprising:

passing a light signal through GFF film;

passing the light signal from the GFF film through a substrate to an HR film;

reflecting the light signal at the HR film back through the GFF film; and

directing the reflected light signal into an output port.

17. The method of claim 16 further comprising:

allowing a portion of the light signal to pass through the HR film; and

directing the portion of the light signal that passes through the HR film into a tap port.

18. The method of claim 16 further comprising:

allowing a portion of the light signal to pass through the HR film;

directing the portion of the light signal that passes through the HR film into a photodiode;

producing an electronic signal in response to the light signal being passed through the HR film into the photodiode.

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19. A gain flattening filter for use in fiber optic communications, the gain flattening filter comprising:

a substrate having a first surface and a second surface;

a first film disposed on the first surface of the substrate, the first film configured to reflect at least a portion of a light signal; and

an second film disposed on the first film, the second film configured to attenuate one or more channels of the light signal.

20. The gain flattening filter of claim 19 wherein the second film is a gain flattening filter (GFF) film.

21. The gain flattening filter of claim 19 wherein the first film is a high reflection (HR) film.

22. The gain flattening filter of claim 21 wherein the HR film is adapted to allow a percentage of the light signal to pass through the HR film.

23. The gain flattening filter of claim 21 wherein the HR film is adapted to allow one or more wavelengths of light to pass through the HR film.

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24. A gain flattening filter for use in fiber optic communications, the gain flattening filter comprising:

a substrate having a first surface, a second surface and a third surface;

a first film disposed on the first surface of the substrate, the first film configured to attenuate one or more channels in a light signal;

a second film disposed on the second surface of the substrate, the second film configured to attenuate one or more channels in a light signal; and

a third film disposed on the third surface of the substrate, the third film arranged to receive the light signal from the first film and to reflect at least a portion of the light to the second film.

25. The gain flattening filter of claim 24 wherein the first and second films are gain flattening filter (GFF) films.

26. The gain flattening filter of claim 24 wherein the third film is a high reflection (HR) film.

27. The gain flattening filter of claim 26 wherein the HR film is adapted to allow a percentage of the light signal to pass through the HR film.

28. The gain flattening filter of claim 26 wherein the HR film is adapted to allow one or more wavelengths of light to pass through the HR film.

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